

# WATER AND PEOPLE

## (The Importance of Water)

### *A Water Resource Education Unit*

- CONCEPT:** Water is one of Earth's most valuable resource — how we use it greatly affects the quality and amount of water available for our use.
- PURPOSE:** This unit teaches students the importance of water in their lives, that water is a precious and limited resource, and ways to conserve it.
- OBJECTIVES:** Students will be able to:
1. make their own conclusion of why water is important
  2. discover how much of Earth's water is available and usable
  3. identify ways in which water is used and how much
  4. learn practical ways to conserve water use

<b><u>CURRICULUM ACTIVITIES:</u></b>	<b><u>SUBJECT AREAS:</u></b>
--------------------------------------	------------------------------

- |  |                              |
|--|------------------------------|
| 1. Water Crossing                              | Language Arts                |
| 2. The Importance of Water<br>(ranger program) | Language Arts, Math, Science |
| 3. Personal Water Use                          | Math                         |
| 4. Water Journal                               | Writing, Language Arts       |
| 5. Up a Creek Without a Paddle                 | Social Studies               |
| 6. Water Monitoring (optional)                 | Science, Math                |



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# WATER AND PEOPLE

## (The Importance of Water)

### OVERVIEW

#### Water Is

Water is a colorless, odorless, transparent liquid occurring on earth as rivers, lakes, oceans, glaciers, groundwater, etc. and falling from the clouds as rain, snow, and ice. It is H<sub>2</sub>O, two parts hydrogen, one part oxygen.

*Water is the best of all things.*

Pinar (c. 522-c. 438 B.C), Olympian Odes

*High quality water is more than the dream of the conservationists, more than a political slogan; high quality water, in the right quantity at the right place at the right time, is essential to health, recreation, and economic growth.*

— Edmund, S. Muskie, U.S. Senator, speech, 1966

*All the water that will ever be is, right now.*

— National Geographic, October 1993

***"Water is life,  
without life, there would still be water,  
without water, there would be no life."***

Everywhere we look, we see water. It fills the rivers, lakes, and oceans and gushes from our facets, shower heads and water hoses. With such an abundance of water all around us, it seems reasonable that water is the most plentiful and least valuable resource on earth. In reality, water is a limited and precious resource. Water is our most valuable natural resource.

*When the well's dry, we know the worth of water.*

— Benjamin Franklin, Poor Richard's Almanac, 1946



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## Water, Water Everywhere?

Earth is called the water planet. From space it appears as a large blue sphere with continents floating in a magnificent sea<sup>1</sup>. It is hard to look at a river like the New River, a large lake, or an ocean and imagine that we could ever run out of water. However, there are areas of the world suffering from water shortages and other areas where the water is so polluted that it cannot safely be used.

Seventy percent of the earth's surface is covered by water, but the portion of water that is available to us is very small. More than 99 % of earth's water is unavailable or unsuitable for human use because of its salinity (salt content), its form (water vapor in the atmosphere), or its location (frozen polar ice caps and glaciers)<sup>1</sup>. The remaining water (0.6 %) available for our use is freshwater and can be found in streams, rivers, lakes, and in underground reserves. However, these supplies of freshwater are further limited because in many places they have become polluted<sup>2</sup>.

The following chart is a breakdown, by percentage, of earth's water resources.

Freshwater (drinkable) -	2.8%	Saltwater (not drinkable) -	97.2%
icecaps & glaciers -	2.18%	Oceans -	97.2%
ground water -	0.61%		
surface water -	0.009%		
atmosphere -	0.001%		

The New River and its tributaries serve as a primary source of water for many communities in this area. Water is taken from lakes and reservoirs created by damming rivers and streams, treated with chemicals and pumped to our homes and businesses. Others get water through wells by pumping it directly from underground supplies. As rain falls on the earth's surface, some of it seeps into the ground and collects in open areas between rock layers. These areas serve as storage tanks for groundwater.

## Why Water Is Important

Water is important for many reasons but probably the most important is that water is needed for survival. People cannot live without it. In fact all living things including plants and animals need water to survive. Humans can live several weeks without food but only a few days without water. "Without water there would be no life."

The human body is approximately 66% or two-thirds water. Our body needs water to regulate its temperature, make blood, help digest food and eliminate waste, and keep itself healthy. In order for our body to stay healthy, we must constantly replace the water (fluid) being lost through these activities. Every day the body uses approximately two quarts of water just to maintain its sys-

Besides survival, water is important to us for bathing, cooking, doing the laundry, and many other activities around the home. Water is also important for a healthy and productive economy. Much of our food crops are grown with the aid of irrigation; water is needed to raise livestock that we depend on for food; in most areas of the country water is used to produce electricity needed for our appliances and lights; and industry uses water in the production or processing of just about everything we buy.

## Using Water and How Much

Despite the extent to which natural forces control water, humans exert a strong influence over it in many ways. We convert, transport, and store water to meet our needs. Dikes, dams, reservoirs, canals, and aqueducts provide water for personal use (domestic), irrigation of crops (agricultural), industry, transportation, and recreation. Of all the freshwater used, about two-thirds (69%) goes to agriculture. Farmers, in areas where rainfall is not adequate, depend on surface and groundwater to raise livestock and irrigate crops.

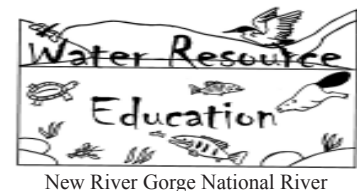
For specific ways water is used in the United States and the amount used by each activity refer to the resource pages entitled "Water Usage" and "Water Use Facts."

Overall the United States has a lot of cheap and clean freshwater. That is not the case for much of the world. In countries where clean, freshwater is scarce, it is highly valued and used sparingly. Some people walk for hours everyday just to get a few gallons for their basic needs. In the United States, we use more water per person than anywhere else in the world.

On average, a person in the United States uses approximately 100 gallons of water per day for drinking, bathing, cooking, washing, swimming, watering gardens, etc. If you factor in the amount of water used by agriculture and industry per day, a person's daily water use equals approximately 1,650 gallons.

As a partner on earth, who depends on its resources for survival, each person must take responsible action to balance their use and the protection of our valuable resources like water.

1. Firehock, Karen. *Hands On Save Our Streams: The Save Our Stream Teacher's Manual*. Gaithersburg, MD: The Izaak Walton League of America, 1994.
2. *Environmental Action: Water Conservation*. Menlo Park, CA: The Tides Center/E2: Environment and Education, 1998.
3. *Quotes About Water*. Washington: U.S. Environmental Protection Agency, 1999
4. *National Water Summary 1990-91, Stream Water Quality: West Virginia*. Washington: U.S. Geological Survey, 1993



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## Post-Visit Activity

<b>Activity</b>	<b>Personal Water Use</b>
<b>Setting</b>	Classroom and home
<b>Duration</b>	30 minutes and 1-4 days data collection
<b>Subject Area</b>	Math, Science
<b>Skills</b>	Calculations, Rationalization, Comprehension, Graphing
<b>Grade Level</b>	6-8

### Objectives:

Students will be able to:

1. gather data and calculate an average daily amount of water used
2. calculate an average amount of water used in the community
3. identify ways water is wasted
4. interpret and graph data

### WV-CSOs:

Math - M.O.6.1.4, M.O.6.5.1,  
M.O.7.1.3, M.O.7.5.3,  
M.O.8.1.3, M.O.8.5.3

Science - SC.O.6.1.06,  
SC.O.6.1.11, SC.O.7.1.06,  
SC.O.7.1.11, SC.O.8.1.06,  
SC.O.8.1.08

### MATERIALS

1. personal water use log and graph
2. resource pages -  
Water Conservation  
Water Usage  
Water Use Facts
3. pencil

### BACKGROUND

Everywhere we look we see water. It gushes from taps, showers, and water hoses. It seems reasonable that water is the most abundant and least valuable resource on Earth. The reality is that water is a limited and precious resource. Water is our most valuable resource because we need it for survival. Without water there would be no life. In the United States, the average person uses 100 gallons of water a day. Our bodies are made up of 66 percent water and we must take in about half a gallon of water every day to stay alive and healthy.

### PROCEDURES

#### Part 1:

1. Pass out a "Personal Water Use" log to each student.
2. Instruct them to use the worksheet to record how much water they use over a 96 hour period of time (4 days).
3. Explain how to record data on the worksheet. Each person will make a mark in the box labeled "# of times the activity was performed" to indicate each time the person uses water (performs each of the activities listed on the Personal Water Use Log).



## NOTES

## PROCEDURES continued

### Part 1 continued:

4. Have students bring their worksheets back to class at the end of the data collection period.

### Part 2:

5. Have each student calculate their personal water use by:
  - a. multiplying each figure in column two by the figure listed in column four to get a total amount of water used per activity and place the number in column five.
  - b. adding all the figures in column five to get a total for "individual use" and for "family use".
  - c. completing # 1 and # 2 at the bottom of the "Personal Water Use" log to calculate an average daily personal water use for each student.

6. Have students complete the water use graph.

"Personal use" = individual's total gallons used per day

"Average class use" = average use of all students in the class. Add up the personal water use totals for all students in the class and divide the total by the number of students in the class.

7. Using the water use graphs, compare the "personal water use" totals with the U.S. average.
8. Discuss the amount of water students use or waste. Have students brainstorm ways to conserve water (see resource



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## EVALUATION

Collect and grade each students "Personal Water Use" log.

## NOTES

## EXTENSION

Ask the students to calculate the following equations. The answers will give the students an idea of how much water is used on a daily and yearly basis. Let them know that these totals only represent water used by individuals and does not take into account how much water is being used daily and yearly by industries and businesses within the community.

To get the number of county residents, call the county library or courthouse to get the county's demographic figures.

$$\begin{array}{r} \text{a.} \quad \text{personal water use} \\ \times \quad 365 \text{ days} \\ \hline = \text{yearly personal water use} \end{array}$$

$$\begin{array}{r} \text{b.} \quad \text{yearly personal water use} \\ \times \quad 72 \text{ yrs. (average lifespan)} \\ \hline = \text{lifetime personal water use} \end{array}$$

$$\begin{array}{r} \text{c.} \quad \text{class average water use} \\ \times \quad \# \text{ of students/teachers in school} \\ \hline = \frac{\text{the amount of water used by the students/}}{\text{teachers at the school each day}} \end{array}$$

$$\begin{array}{r} \text{d.} \quad \text{class average water use} \\ \times \quad \# \text{ of residents in the county} \\ \hline = \frac{\text{the amount of water used for personal needs in}}{\text{the county each day (county's daily personal water use)}} \end{array}$$

$$\begin{array}{r} \text{e.} \quad \text{county's daily personal water use} \\ \times \quad 365 \text{ days} \\ \hline = \text{the amount of water used for personal needs in} \\ \text{the county each year} \end{array}$$



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# WATER & PEOPLE

## Personal Water Use Log



**Direction:** Collect data on this chart for a 96-hour period (4 days) New River Gorge National River

H <sub>2</sub> O Use activity	# of times the activity was performed	multiply	average H <sub>2</sub> O used / activity	total H <sub>2</sub> O used / activity
<b>Drinks</b> (H <sub>2</sub> O, soda milk, juice, etc.)		X	1/16 gal.	gals.
<b>Brushing teeth</b>		X	1 gal.	gals.
<b>Washing hands</b>		X	1/2 gals.	gals.
<b>Flush the toilet</b>		X	5 gals.	gals.
<b>Take a shower</b>	# of minutes _____	X	5 gals./min.	gals.
<b>Take a bath</b>		X	40 gals.	gals.
<b>(A)</b> = _____ (# of people in family) <b>(B)</b> = Individual use =				gals.

<b>Washing dishes</b>		X	10 gals.	gals.
<b>Dishwasher</b>		X	15 gals./load	gals.
<b>Cooking a meal</b>		X	5 gals./meal	gals.
<b>Washing clothes</b>		X	30 gals./load	gals.
<b>(C)</b> = Family use =				gals.

1. \_\_\_\_\_ divided by \_\_\_\_\_ = \_\_\_\_\_ gals.  
**(C)**                      **(A)**                      **(D)**

2. \_\_\_\_\_ plus \_\_\_\_\_ divided by 4 = \_\_\_\_\_ gals.  
**(B)**                      **(D)**                      **Personal Water Use**

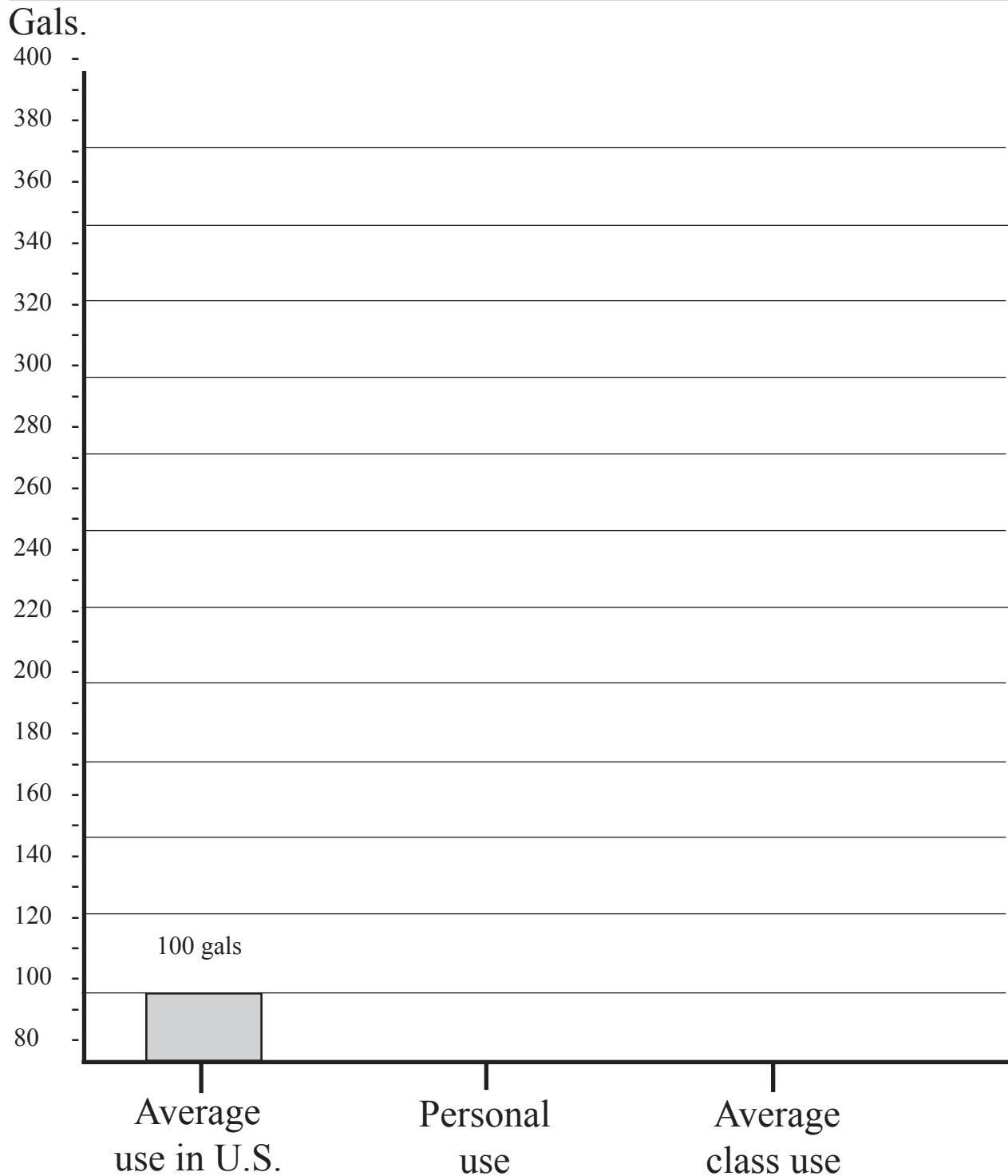


# WATER & PEOPLE

## Personal Water Use Graph



**Direction:** Draw a bar graph using your personal water use per day and the average of each student in class.



# WATER & PEOPLE

## Resource Page — Water Conservation

1. Take short showers, set an egg timer for five minutes or replace your shower head with a low flow shower head.
2. Turn off the water while brushing your teeth or washing dishes.
3. Fill dishwashers and washing machines completely before washing a load. If possible, use an energy-saving cycle.
4. Fill half-gallon plastic jugs partway with rocks then finish filling with water and place one in the back of each toilet. You can save as much as ten gallons of water a day.
5. Collect the water that drips out of your air conditioner and use it for watering house plants.
6. Thoroughly clean an empty milk or juice jug. Fill it with water for drinking and put it in the refrigerator. By doing this, you don't have to stand at a running faucet waiting for the water to cool for a drink.
7. When watering the lawn with a sprinkler, choose a shady area to water or wait until evening when less evaporation will occur.
8. When children want to play with water, instead of letting the hose or faucet run, fill some buckets with water and give them paint brushes. They will enjoy painting everything in sight.
9. Save water while washing the car by using a bucket to wash with and by putting an automatic shut off nozzle on the hose.
10. When buying new appliances, shop around for a water-saving brand.
11. Recycle paper. Every ton of recycled paper saves 7,000 gallons of water that would be used in paper production.
12. Flush the toilet only when necessary. Liquid wastes are not as dangerous as solid wastes, so you do not need to flush everytime there is only a liquid waste in the toilet. "If its yellow let it mellow, if its brown flush it down."
13. Properly disposing of chemicals and reducing the amount of trash produced will reduce pollution that could enter groundwater from landfills and illegal dumps.



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## Post-Visit Activity

<b>Activity</b>	<b>Water Journal</b>
<b>Setting</b>	Homework or Classroom
<b>Duration</b>	30 minutes
<b>Subject Area</b>	Language Arts, Writing
<b>Skills</b>	Thinking, Writing, Sentence structure
<b>Grade Level</b>	6-8

### Objectives:

Students will be able to:

1. keep a log of what they are learning about water resources
2. express their feelings about water resources
3. describe how they can integrate what they have learned in the water resource curriculum into their personal lives

### WV-CSOs:

Language Arts - RLA.O.6.1.06,  
RLA.O.6.2.03, RLA.O.7.2.05,  
RLA.O.8.2.05

Science - SC.O.6.1.06,  
SC.O.6.2.09, SC.O.7.1.06,  
SC.O.8.1.08, SC.O.8.2.26

### MATERIALS

1. notebook or writing pad
2. pen

### BACKGROUND

The water journal allows students an opportunity to reflect on and record what they are learning about their water resources. Students can also use the journals to express their personal thoughts and feeling about Earth's water resources and how their lives are impacted by what happens to the water around them.

This activity is most effective if conducted at the end of the week. Other activities within the unit will be completed and students can incorporate the information learned through all the activities into thoughtful writings.

Students should be encouraged to follow proper writing styles, sentence structure, and grammar when making entries in their journals.

### PROCEDURES

1. Have each student create their own journal to permit personal style and creativity.
2. Have students write daily or weekly to record their thoughts on the day or week's water resource program and related activities.



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## NOTES

## PROCEDURES *continued*

3. Have students address the following items when recording their thoughts:
  1. What concepts did he/she learn from this week's water resource program and activities.
  2. Which of the water resource activities did he/she enjoy and why.
  3. From what I learned this week, I can have a positive impact on our water resources by making these changes in my personal life.

### NOTE:

Have students fill up the front and back of each page with their writings (they do not have to start a new page for each entry.) This will save paper.

## EVALUATION

Periodically evaluate and grade each student's journal based on content, sentence structure and grammar.

## EXTENSION

Encourage students to integrate self-expression and creativity in their journals through poetry, song writing, art work or an article for a newspaper.



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# WATER & PEOPLE

## Post-Visit Activity

**Activity****Adapted from****Setting****Duration****Subject Area****Skills****Grade Level**

### Up a Creek Without a Paddle

"Raining Cats and Dogs" - Project Wet

Classroom

45 minutes

Language Arts, Social Studies

Gathering information, Organizing, Identifying

6-8

#### Objectives:

Students will be able to:

1. distinguish between figurative and literal translations of various water sayings

#### WV-CSOs:

Language Arts - RLA.O.6.1.01, RLA.O.6.1.06, RLA.O.7.1.01, RLA.O.7.1.06, RLA.O.7.1.08, RLA.O.8.1.01, RLA.O.8.1.08, RLA.O.8.1.10

#### MATERIALS

1. copies of Water Proverbs /Sayings
2. copies of Water Sayings and Water Illustrations
3. copies of Water Scenarios

#### BACKGROUND

Sayings, proverbs, or adages exist in all cultures. They express the beliefs, values, and lifestyles of the people. Although proverbs are common to all cultures their expression and interpretation are unique. Proverbs are rich in tradition; they are generally passed from generation to generation and often represent the collective wisdom of a culture.

Because we are all dependent on water, proverbs related to observations about water pervade all cultures. The interpretation of a proverb often reflects ideas about how a person should live within that culture.

Sometimes the sayings or proverbs from two different countries may have a similar meaning, but different modes of expression. For example, in Japan one might say "Fukusui bon ni kaerazu," or "Spilt water never returns to the tray." In English one would comment, "It's no use crying over spilled milk." A possible interpretation for both of these sayings is that one should not have regrets over what has already occurred.

Proverbs and sayings provide insight into a culture and indicate a people's awareness of and relationship with water. This activity looks at a variety of water proverbs and their meanings from around the world.



## NOTES

## PROCEDURES

### Part 1

1. Begin this activity by discussing what proverbs are. Relate how proverbs pass from generation to generation, occur in most cultures, and reflect the values and beliefs of people. Explain how proverbs have been used to teach lessons or morals or to indicate how individuals should conduct themselves within a culture.
2. Ask students to share proverbs that they have heard in their own families (list them on the board). Any proverb or saying is a good example; however, have students think of some that relate to water.
3. Ensure that students understand the difference between literal and figurative meanings for a proverb or saying. For example, the literal translation of "raining cats and dogs" entails household pets falling from the sky. Figuratively, it implies a heavy rainfall. Discuss the literal and figurative meanings of some of the proverbs listed on the board.
4. Use Part 2 and 3 to demonstrate examples of literal and figurative translations of water proverbs or sayings.

### Part 2 - (literal translation)

5. In this part of the activity, students are to determine the literal translation of a water saying.
6. Display the "Water Illustrations".
7. Read or have a student read one of the "Water Sayings". Have students select which illustration matches the saying.
8. Continue by reading each "Water Saying" and matching it with the correct illustration.

### Part 3 - (figurative translation)

9. In this part of the activity, students are to determine the figurative translation of a water scenario.



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## NOTES

## PROCEDURES continued

### Part 3 continued

10. Display the "Water Sayings"
11. Read or have a student read one of the "Water Scenarios"  
Have students select a "Water Saying" which best completes the scenario.
12. Continue by reading each "Water Scenario" and selecting the proper saying.

### Part 4

13. Divide the class into five or six groups.
14. Give each group a copy of the "Water Proverbs/Sayings."
15. Have each group select four of the sayings and
  - a. draw an illustration to match the literal meaning of the saying
  - b. determine the figurative meanings of each saying.
16. Have each group share one or more of their illustrations and figurative meanings with the class.

## EVALUATION

Make sure that the students know the right answer for each of the "Water Sayings" and "Water Scenario" cards.

## EXTENSION

Have students gather water sayings from home to share with the class.



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## Water Proverbs/Sayings (from Project Wet)



**Directions:** Make a copy for each group.

- ♦ A drop in the bucket
- ♦ A flood of . . . (tears, mail)
- ♦ A stepping stone to . . .
- ♦ Blood is thicker than water
- ♦ Bridge over troubled waters
- ♦ Break the ice
- ♦ Can barely keep my head above water
- ♦ Crying buckets
- ♦ Don't change horses in mid-stream
- ♦ Down the drain
- ♦ Even if you sit at the bottom of the sea, you cannot be a fish (Africa)
- ♦ Feeling swamped
- ♦ Get your feet wet
- ♦ Get your ducks in a row
- ♦ Have an umbrella ready before you get wet (Japan)
- ♦ Having a ripple effect
- ♦ If a crocodile deserts the water, he will find himself on a spear (Africa)
- ♦ If there is a continual going to the well, one day there will be a smashing of the pitcher (Africa)
- ♦ In hot water
- ♦ It's all water under the bridge
- ♦ Jump in with both feet
- ♦ Like a duck to water
- ♦ Like water off a duck's back
- ♦ Little by little the cup is filled (Spain)
- ♦ Maddier than a wet hen
- ♦ Make a big splash
- ♦ My cup runneth over
- ♦ One hand washes the other
- ♦ Pull the child out of the water before you punish it (Africa)
- ♦ Raining cats and dogs
- ♦ Riding the waves
- ♦ Sink or swim
- ♦ Skating on thin ice
- ♦ Somebody is all wet
- ♦ Something smells fishy
- ♦ Tip of the iceberg
- ♦ The stone in the water knows nothing of the hill which lies parched in the sun (Africa)
- ♦ The well has run dry
- ♦ Today is the elder brother of tomorrow, and a heavy dew is the elder brother of rain (Africa)
- ♦ Took hook, line, and sinker
- ♦ Troubled waters
- ♦ Wash my hands of the whole matter
- ♦ Watered down
- ♦ We'll cross that bridge when we get there
- ♦ Wet behind the ears
- ♦ Wet your whistle
- ♦ When it rains, it pours
- ♦ When our ship comes in
- ♦ With too many rowers, the ship will crash into the mountain (Japan)
- ♦ You are not the alligator's brothers, though you swim well by his side
- ♦ You can lead a horse to water, but you can't make it drink
- ♦ You won't miss the water till the well



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Water Illustration (from Project Wet)



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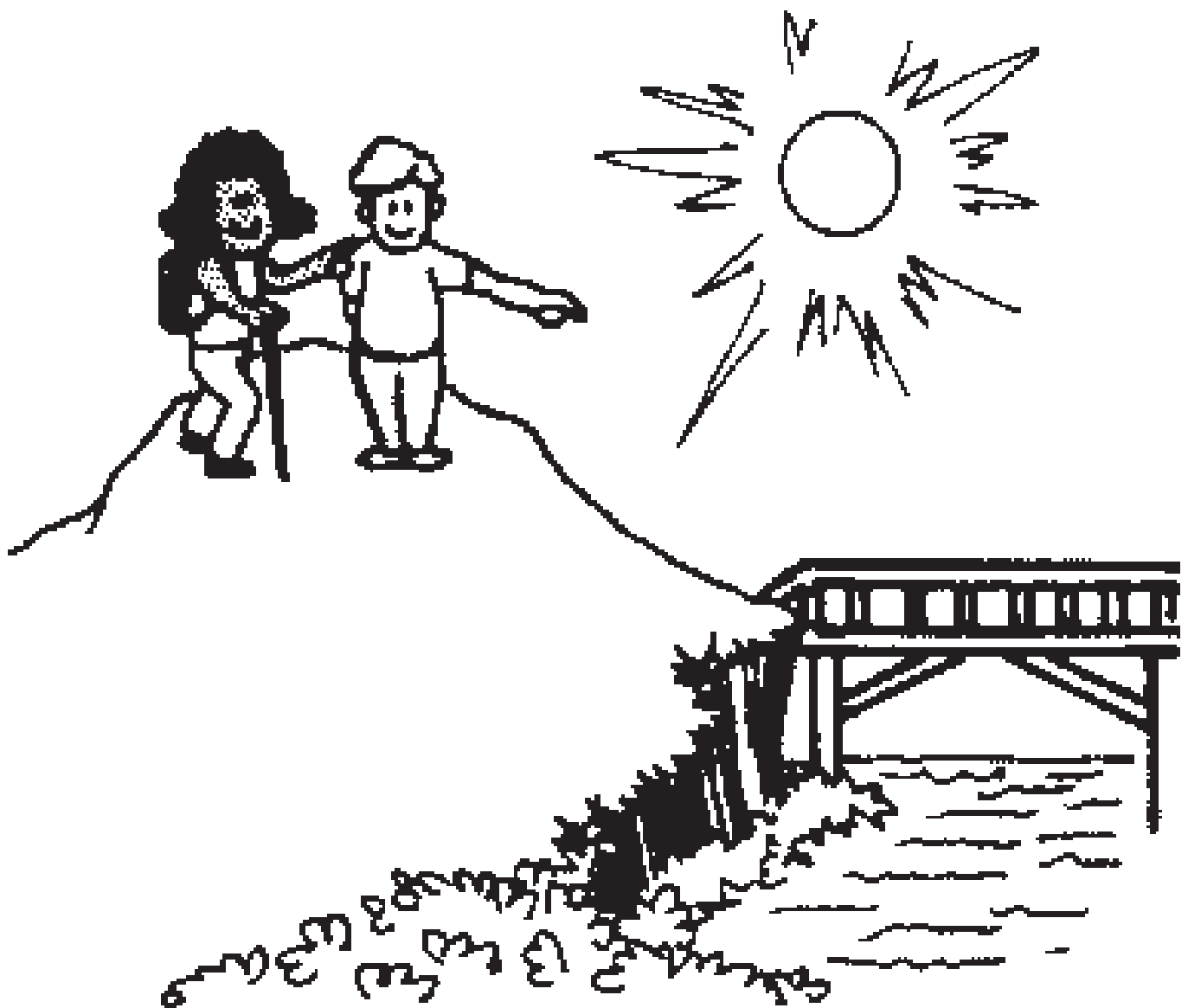


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Water Illustration (from Project Wet)



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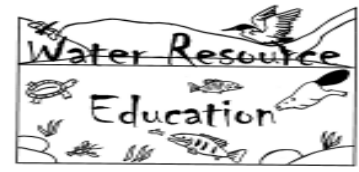


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Water Scenario (from Project Wet)



"So, what happened when your mom got home and saw the mess we made?"

"I bet she wasn't too happy about the cherry soda we sprayed on the curtains, or the chocolate sauce we smeared on the white carpet, or the rec. room that we filled with water -- I was sure we could make an indoor swimming pool."

"She was . . . . ! She said I was grounded until I was a grandfather!"

# WATER & PEOPLE

Water Scenario (from Project Wet)



"I can't believe Yasu."

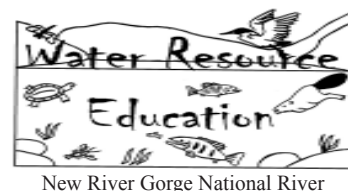
"The music was awesome at the dance; the girl he wanted to ask was there and he stood by the refreshment table all night."

"He didn't even ask one person to dance."

"Well, you know they say . . . ."

# WATER & PEOPLE

Water Scenario (from Project Wet)



"Mom, can I have four quarters for a video game?"

"No, son, we don't have time."

"Please, Mom, I'll hurry; I only need four quarters."

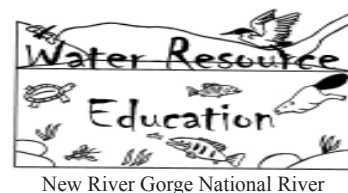
"No, we're already late for dinner."

"Come on, Mom, you always say that. Please, just four quarters."

"That's enough, Garrett, You're . . . ."

# WATER & PEOPLE

Water Scenario (from Project Wet)



"Mom, I played well this week, but what about the game next week?

What if I miss a fly ball?

What if I strike out?

What if a grounder gets past me?"

"Juan, don't worry, . . . . ."



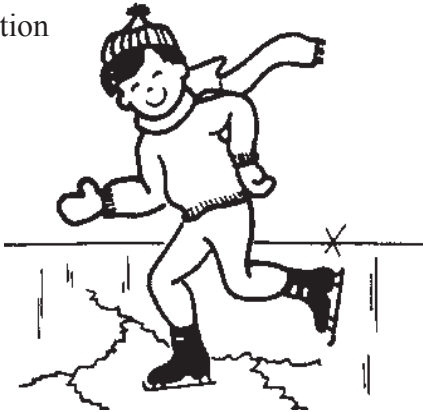
# WATER & PEOPLE

## Water Illustrations (answer key)



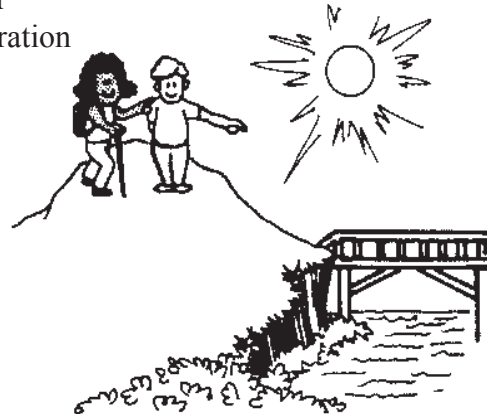
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Water  
Illustration



Answer: Skating on thin ice.

Water  
Illustration



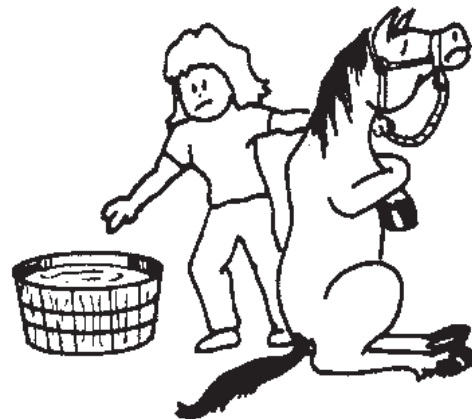
Answer: We'll cross that bridge  
when we get there.

Water  
Illustration



Answer: Madder than a wet hen.

Water  
Illustration



Answer: You can lead a horse to water,  
but you can't make it drink

# WATER & PEOPLE

## Water Scenarios (answer key)



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<p>Water Scenario 1.</p> <p>So, what happened when your mom got home and saw the mess we made? I bet she wasn't too happy about the cherry soda we sprayed on the curtains, or the chocolate sauce we smeared on the white carpet, or the rec. room that we filled with water -- I was sure we could make an indoor swimming pool.</p> <p>"She was . . . ! She said I was grounded until I was a grandfather!"</p> <p>Answer: Maddier than a wet hen.</p>	<p>Water Scenario 2.</p> <p>"I can't believe Phyllis has broken up with Mark. She was crazy about him. It must be because he embarrassed her in the cafeteria yesterday."</p> <p>"No, Phyllis has been telling me about their problems for a long time. The blowup in the cafeteria was just . . . ."</p> <p>Answer: Tip of the iceberg.</p>
<p>Water Scenario 3.</p> <p>"Mom, can I have four quarters for a video game?"</p> <p>"No, son, we don't have time."</p> <p>"Please, Mom, I'll hurry; I only need four quarters."</p> <p>"No, we're already late for dinner."</p> <p>"Come on, Mom, you always say that. Please, just four quarters."</p> <p>"That's enough, Garrett, You're . . . ."</p> <p>Answer: Skating on thin ice.</p>	<p>Water Scenario 4.</p> <p>"Mom, I played well this week, but what about the game next week? What if I miss a fly ball? What if I strike out? What if a grounder gets past me?"</p> <p>"Juan, don't worry, . . . ."</p> <p>Answer: We'll cross that bridge when we get there.</p>

# A RIBBON OF LIFE

## Post-Visit Activity (optional)

<b>Activity</b>	<b>Water Monitoring</b>
<b>Setting</b>	Classroom or along a river or stream
<b>Duration</b>	1 hour
<b>Subject Area</b>	Science and Math
<b>Skills</b>	Data collection, Recording, Graphing, Technical equipment use
<b>Grade Level</b>	6-8

### Objectives:

Students will be able to:

1. perform several water quality tests
2. collect and record data about water quality
3. chart data on a graph

### WV-CSOs:

Math - M.O.6.5.1, M.O.7.5.3, M.O.8.5.3

Science - SC.O.6.1.06, SC.O.6.1.08, SC.O.6.1.09, SC.O.6.1.11, SC.O.6.1.12, SC.O.6.2.09, SC.O.6.2.12, SC.O.7.1.06, SC.O.7.1.08, SC.O.7.1.09, SC.O.7.1.11, SC.O.7.1.12, SC.O.7.2.14, SC.O.8.1.04, SC.O.8.1.05, SC.O.8.1.06, SC.O.8.1.08, SC.O.8.2.26

### MATERIALS

Refer to the equipment and materials list for this activity found in the "Water Monitoring" Unit.

### BACKGROUND

Water quality is affected directly and indirectly by everything that happens within a watershed. Activities including logging, construction, agriculture, industry, and mining can have a significant impact on the quality of water within the watershed. Water quality is also affected by the daily activities of individuals, neighborhoods, towns, and communities.

Monitoring water quality is necessary in establishing baseline conditions within a river or stream. It also provides a way to determining significant changes and problems, temporary or long-term, in water quality.

This activity allows students to perform several water quality tests on samples taken from a local stream or river. They will collect data, record their findings, graph the data, and track their findings over several weeks to determine the quality of the water being tested. At the end of this data gathering period, they should be able to note any temporary changes that have occurred in the stream or river.

### PROCEDURES

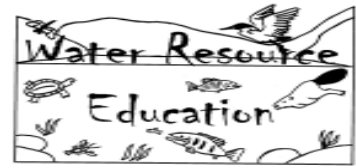
Procedures to conduct this activity can be found in the "Water Monitoring" Unit.



New River Gorge National River

# WATER AND PEOPLE

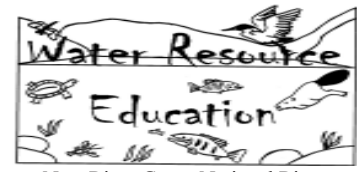
## Unit Quiz — A



1. Water is a clear liquid that is \_\_\_\_\_, \_\_\_\_\_, and tasteless.  
A. colorless  
B. weightless  
C. odorless  
D. a. and c.
2. Water is important because all living things need it to \_\_\_\_\_.  
A. swim in  
B. survive  
C. cook  
D. make paper
3. What percentage of earth's water is saltwater and is not readily available for our use?  
A. 38%  
B. 50.6%  
C. 70%  
D. 97.2%
4. 66% of our body is water.  
A. true  
B. false
5. What percentage of earth's freshwater is readily available for our use?  
A. .6%  
B. 1.6%  
C. 6%  
D. 66%
6. On average, approximately how many gallons of water does a person use each day?  
A. 24  
B. 100  
C. 176  
D. 210
7. Water is not a limited and precious resource.  
A. true  
B. false
8. In the United States, what type of use consumes the largest amount of water?  
A. recreational use  
B. industrial use  
C. personal use  
D. agricultural use
9. Taking shorter showers or installing a low-flow showerhead will conserve water.  
A. true  
B. false
10. One way to conserve water use is by recycling paper because every ton of recycled paper saves 7,000 gallons of water.  
A. true  
B. false

# WATER AND PEOPLE

## Unit Quiz — B



1. 66% of our body is water.                      A. true                      B. false
2. What percentage of earth's water is saltwater                      A. 38%                      B. 50.6%  
and is not readily available for our use?                      C. 70%                      D. 97.2%
3. What percentage of earth's freshwater is                      A. .6%                      B. 1.6%  
readily available for our use?                      C. 6%                      D. 66%
4. Water is a clear liquid that is \_\_\_\_\_,                      A. colorless                      B. weightless  
\_\_\_\_\_, and tasteless.                      C. odorless                      D. a. and c.
5. Taking shorter showers or installing a                      A. true                      B. false  
low-flow showerhead will conserve water.
6. Water is not a limited and precious resource.                      A. true                      B. false
7. On average, approximately how many                      A. 24                      B. 100  
gallons of water does a person use each day?                      C. 176                      D. 210
8. In the United States, what type of use                      A. recreational use                      B. industrial use  
consumes the largest amount of water?                      C. personal use                      D. agricultural use
9. One way to conserve water use is by recycling                      A. true                      B. false  
paper because every ton of recycled paper  
saves 7,000 gallons of water.
10. Water is important because all living things                      A. swim in                      B. survive  
need it to \_\_\_\_\_.                      C. cook                      D. make paper

# WATER AND PEOPLE

## Unit Quiz — (Answer Key)



New River Gorge National River

### Quiz A

1. D. a. and c.
2. B. survive
3. D. 97.2%
4. A. true
5. A. .6%
6. B. 100
7. B. false
8. D. agricultural use
9. A. true
10. A. true

### Quiz B

1. A. true
2. D. 97.2%
3. A. .6%
4. D. a. and c.
5. A. true
6. B. false
7. B. 100
8. D. agricultural use
9. A. true
10. B. survive

# WATER & PEOPLE

## Resource Page — Water Usage



Uses	Amount (gallons)	Source
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### Domestic

washing hands	1/4	NGS-WM
flushing toilet (per flush)	5	NGS-WM
low flow toilets (per flush)	1.6	W-GAEE
taking a shower	5 gal. per minute	NGS-WM & WC
low flow shower head	1.5 gal. per minute	WC
bath in the bathtub	40	NGS-WM
brushing teeth (facet left running)	1	NGS-WM
washing dishes by hand (water turned on and off)	10	NGS-WM
washing dishes in dishwasher	15	NGS-WM
washing a load of laundry	30	NGS-WM
watering the lawn for 30 minutes	240	NGS-WM
using a water hose (water left running)	10 gal. per minute	ACWF

### Agricultural (to produce/grow)

one ear of corn	25	ACWF & BW-W
one gallon of milk	3	ACWF & DRG
one steak	2,607	50 things & WC
one pound of meat (hamburger)	5,000	DRG
one pound of chicken	815	WC
one ton of sugar	1,000	DRG
one loaf of bread	150	DRG, WC, USGS
one pound of potatoes	24	DRG
one pound of oranges	47	DRG
one pound of carrots	33	WC
one egg	120	DRG, USGS



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Uses	Amount (gallons)	Source
<u>Industrial</u> (to make)		
a soft drink	10	GW
hamburger, fries and drink	1,400	DRG, ACWF, & B W-W
one automobile	100,000	WWW-IDE, DRG, WC
	& B W-W	
one gallon of gasoline	70	ACWF & B W-W
one copy of a Sunday newspaper	150	W-GAEE & DRG
one ton of brown paper for bags	82,000	WC
one pound of aluminum (29 cans)		1,000 WWW-IDE,
NGS-WM		
		& WC
one pound of plastic	24	DRG
one ton of steel	40,000	DRG

#### Resources:

ACWF =	America's Clean Water Foundation
B W-W =	Be Water-Wise
NGS-WM =	National Geographic Society, Water Matters
50 Things =	50 Things You Can Do to Save the Earth
DRG =	Delaware River Greenway
W-GAEE =	Water - Good Apple Environmental Education
WWW-IDE =	Wet & Wild Water, Indiana Department of Education
WC =	Water Conservation, The Tides Center
OEBWP =	Our Environment Battles Water Pollution
USGS =	United States Geological Survey



New River Gorge National River



# **WATER & PEOPLE**

## **Resource Page — Water Use Facts**

It takes 1,630,000 gallons of water to produce enough food to feed one United States citizen for a year (50 Things).

40% of household water use is flushed down the toilet (50 Things).

The human body is made up of 66% water. The brain is 75% water; blood is 83% water and bones consist of 22% water (B W-W).

An apple is 80% water while a tomato consists of 95% water (B W-W).

The average daily water use per person in the United States equals 1,650 gallons. (ACWF)

The U. S. groundwater reserves are enormous — approximately 33,000 trillion gallons; however, we are using up this reserve faster than it can be replaced by nature (WC).

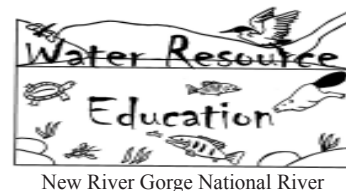
Water is very cheap in the U. S. The average price of water is .0013 cents per gallon (\$1.30 per 1,000 gallons) (WC).

1990 average daily water use per person (including agricultural and industrial use) (WC).	<b>Country</b>	<b>Gallons per Day</b>
	Australia	945
	Canada	1,268
	China	334
	Colombia	129
	Kenya	35
	Germany	466
	Japan	668
	United States	1,565

Agriculture is the greatest use of water worldwide, industrial use is second, and municipal use is third. In the U.S., over 65% of all water use goes to irrigation (WC).

Water use has increased dramatically over the last century primarily due to population increase; increased use by agriculture for irrigation to meet demands for food production; expansion of water-demanding industries; and increase in diets that rely on meat (WC).

One gallon of water weighs 8.33 pounds (OEBWP).



A leaky faucet can use up to 4,000 gallons of water per month (EPA).

The average American uses about 9,000 gallons of water to flush 230 gallons of waste down the toilet per year (EPA).

Washing a sidewalk or driveway with a hose uses about 50 gallons of water every five minutes (EPA).

It is estimated that the use of water-efficient plumbing fixtures can save a typical four-member household 55,800 gallons of water and \$627 in reduced water and energy costs per year (EPA).

The amount of water we use in our homes varies during the day (EPA).

Lowest use	11:30 p.m. to 5:00 a.m.
Moderate use	noon to 5:00 p.m.
High use	5:00 to 11:30 p.m.
Highest use	5:00 a.m. to noon (Peak hour is 7:00-8:00 a.m.)

It takes 620 gallons of water to apply an inch of water to 1,000 square feet of lawn or garden (PA-DEP).

In 1995, industry in the United States used about 27 billion gallons of water per day, chemical and paper industries use the most. (USGS)

It takes approximately 28 gallons of water to produce one kilowatthour of thermoelectric power (USGS).

If you get one newspaper a day for a year, 66,000 gallons of water will be used in the process of making that newspaper (GW).

#### Resources:

ACWF =	America's Clean Water Foundation
B W-W =	Be Water-Wise
50 Things =	50 Things You Can Do to Save the Earth
WC =	Water Conservation, The Tides Center
OEBWP =	Our Environment Battles Water Pollution
EPA =	U. S. Environmental Protection Agency
PA-DEP =	Pennsylvania Dept. of Environmental Protection
USGS =	United States Geological Survey
GW =	Getwise Facts & Tips